



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

# PUBLIC HEALTH REPORTS.

---

VOL. XXVI.

JUNE 23, 1911.

No. 25.

---

## SMALLPOX IN THE UNITED STATES—PREVALENCE AND GEOGRAPHIC DISTRIBUTION DURING THE CALENDAR YEAR 1910.<sup>1</sup>

Compiled by JOHN W. TRASK, Assistant Surgeon General.

Smallpox continued to be prevalent in the United States during the calendar year 1910, a greater number of cases being reported than during the preceding year.<sup>2</sup> There was also a greater number of reported deaths. The reports for the year 1909 received by the Surgeon General of the Public Health and Marine-Hospital Service totaled 24,099 cases with 150 deaths, whereas for the year 1910 the numbers were 30,352 cases and 415 deaths. The cases for the year 1910 were reported from 36 States and the District of Columbia. Complete information of the number of cases reported for the entire year was furnished directly by the State health authorities or was otherwise available for 26 States and the District of Columbia. In other States the health authorities reported the prevalence of the disease for but part of the year, and in others reports were received only from certain cities.

### PREVALENCE.

The general prevalence and geographic distribution of the disease are shown by the tables and maps on succeeding pages. Connecticut was the only State furnishing complete information in which no case was reported.

The greatest numbers of cases were reported in North Carolina, Texas, Michigan, Oklahoma, and Kansas, with 4,281, 2,925, 2,585, 2,342, and 2,202 cases, respectively. Tennessee reported 2,199 cases for a part of the year only.

The increase of the disease in Florida is notable. In this State only 3 cases were reported in 1909, while in 1910, 1,286 were recorded. There was also an increase in Colorado from 345 cases in 1909 to 1,096 in 1910, in the District of Columbia from 24 cases in 1909 to 96 in 1910, in Michigan from 1,175 in 1909 to 2,585 in 1910, in North Carolina

---

<sup>1</sup> From information furnished by State and local health authorities and registrars.

<sup>2</sup> For an account of the prevalence of smallpox during 1909 see Public Health Reports, Vol. XXVI, No. 22, June 2, 1911, p. 799. For the same information for 1908 see American Journal of Public Hygiene, Vol. XX, No. 1, Feb., 1910, p. 133.

from 1,733 to 4,281 cases, in Oklahoma from 1,434 to 2,342, in Pennsylvania from 25 to 168, and in the State of Washington from 310 to 583 cases.

A decrease is noted in Illinois from 2,135 cases in 1909 to 730 cases in 1910, in Indiana from 1,363 cases in 1909 to 764 cases in 1910, in Minnesota from 1,430 to 1,002, in New York from 762 to 353, in Ohio from 1,328 to 759, in Utah from 1,854 to 966, and in Wisconsin from 1,208 to 443 cases.

There was practically no change in the prevalence of the disease during the years 1909 and 1910 in the following States: Kansas, Montana, North Dakota, and Oregon. Comparatively but few cases of smallpox were reported in New Hampshire and New Jersey, and, as previously stated, there was none in Connecticut.

Although no reports are available for the State of Georgia as a whole, 389 cases were reported in the city of Macon.

There is no evidence at hand to indicate that the disease was less prevalent in the States from which reports for the year were not available than it was in those from which reports were received. In fact it would naturally be expected that an infectious disease such as smallpox would spread more rapidly and cause more cases in those States in which it was not promptly reported and in which therefore the number and location of cases were not known to the local and State authorities, who, for this reason, would be placed at a disadvantage in their attempts to control the disease.

#### CASE RATE.

The distribution of the cases per unit of population gives a better idea of the relative prevalence of the disease. Utah had the highest case rate, the 966 cases reported being at the rate of 257.32 for each 100,000 inhabitants. In 1909 Utah also had the highest case rate with 507 cases for each 100,000 inhabitants. The next highest rates for 1910 were in North Carolina, Florida, Montana, Oklahoma, and Colorado with rates of 193.45, 169.5, 167.32, 139.75 and 136.23 respectively for each 100,000 inhabitants. The lowest rate was in Connecticut with no case. The next lowest rates were in Maryland, New Jersey, Maine, Pennsylvania and New Hampshire, with rates of 0.46, 0.86, 1.07, 2.18 and 2.32, respectively.

#### FATALITY.

One of the most notable features of the smallpox which has been more or less prevalent in the United States for at least ten years is its extreme mildness and the small number of deaths which it has caused. In 1909 the combined States from which complete reports were received had 19,534 cases with 92 deaths which was a mortality rate of 0.471 for each 100 cases. In 1910 the rate was considerably higher but still remarkably low when compared with the rates reported from other countries.

Reports as to the prevalence of smallpox during the calendar year 1910 and the number of deaths due to this disease are available for the following States: Colorado, District of Columbia, Florida, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New Jersey, New York,

North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Utah, and Washington.

These States with a combined estimated mid-year population of 54,435,700 reported 23,552 cases with 385 deaths, an average of 43.27 cases for each 100,000 inhabitants and 1.63 deaths in each 100 cases.

In outbreaks of smallpox reported abroad the deaths usually number from 20 to 40 for each hundred cases. To explain the small number of deaths in the United States, we may presume that either the people are partially immune to the disease or else that the existing infection is extremely mild and nonvirulent. Immunity might be the result of general vaccination or a racial characteristic otherwise acquired.

That the community is protected by vaccination may be true for certain localities, but that the protection thus afforded is general can hardly be maintained. Japan as a nation is probably as well or better protected by vaccination than is the United States,<sup>1</sup> and yet in 1907-8 there was an outbreak of smallpox in Japan in which 19,101 cases were reported with 6,273 deaths. Vaccination did not there modify the type of the disease to that found in America. In that outbreak among 5,215 smallpox patients 1,527 were found who had never been vaccinated.<sup>2</sup> This is interesting as indicating a relatively small number of unvaccinated individuals. The epidemic was apparently one of considerable virulence, the general death rate per hundred being 42.25 among the cases in 1907 and 32.32 among those in 1908, while the deaths among the unvaccinated were 69.4 per hundred cases. Kitasato believes that the virulence of the disease varies and that when it reaches the high point attained in Japan during 1907-8 individuals who have been previously vaccinated, and even those who have previously had an attack, contract the disease. In this outbreak there were 242 cases in seven prefectures in which the patients had previously had the disease. Of these, 57 died.

If the nonvirulence of the disease in this country is due to protection by vaccination it would be expected that the mild cases would be found only in those so protected. This may be assumed from the limited information available not to be the case. Records of the vaccination history of all patients would undoubtedly add much to our knowledge of the subject.

That the type of the disease as seen in the United States is due to the protective value of vaccination is shown not to be true for certain localities in which outbreaks of the virulent form of the disease have been reported. These outbreaks have occurred at widely separated points extending from Virginia and South Carolina in 1909 to Michigan, Oklahoma, Texas, and Oregon in 1910. The cases of the disease reported in New York City in 1910 also had a high percentage of deaths. These outbreaks showed a high virulence, the deaths being at the rate of from 16.13 at Cleveland, Ohio, to 54.05 in Oklahoma County, Okla., per hundred cases.

It would seem that the possible explanation of the mild type of the disease in this country is that it is due to a less virulent strain of infection. This, then, raises the question as to the source of the more severe outbreaks which occur—that is, whether each outbreak is an instance of infection brought in from abroad or carried from some

<sup>1</sup> Irwin, Fairfax. Smallpox in Japan, Public Health Reports, Vol. XXV, No. 35, Sept. 2, 1910, p. 1205.

<sup>2</sup> Kitasato, S. Vaccination and Smallpox in Japan, Jour. Am. Med. Assn., Mar. 25, 1911 p. 889.

other virulent focus within the country, or whether the mild strain of the disease under certain conditions becomes virulent. This it is believed can probably be solved only by the careful recording of the salient facts in each case.

#### VIRULENT OUTBREAKS.

During the year there were recorded 11 localities in which smallpox showed a high death rate. In most of the instances these were apparently distinct and separate outbreaks, clearly differentiated from the cases of the milder type of the disease which had prevailed in the same localities previous to the onset of the more severe type, and which in some occurred afterwards as well.

#### MICHIGAN.

Michigan had been having for several years quite a number of cases of smallpox. These were widely distributed throughout the State and were of the prevailing mild type. In 1909 there had been 1,175 reported cases with only 4 deaths. During 1910, however, three outbreaks occurred in which the mortality rate was high, and in all there were 121 deaths. These outbreaks occurred in Bay City, Saginaw, and Lapeer, located in Bay, Saginaw, and Lapeer Counties, respectively.

#### BAY CITY.

For several months mild cases of smallpox, all of which recovered, had been occurring in Bay City and vicinity, and the last death from this disease in Michigan had been in December, 1909, when suddenly in March, 1910, 61 cases with 8 deaths were reported in Bay City. Most of these were confluent and many were hemorrhagic. In April there were 29 cases with 13 deaths, in May 13 cases and 7 deaths, in June 5 cases and 1 death, and in July 2 cases and 1 death. During the remaining months of the year there were a few cases, but all recovered. The disease was not limited to any special group of people. In the virulent outbreak within the city, if all the cases occurring from March to October, inclusive, are counted, there was a total of 114 cases with 30 deaths, which gives a case mortality of 26.31 per hundred.

#### SAGINAW.

The outbreak in Saginaw resembled the preceding in that for months there had been present cases of the disease but no deaths. The cases suddenly jumped from 3 cases with no deaths in September to 81 cases with 19 deaths in October and 82 cases with 29 deaths in November. During December no cases were reported.

The president of the board of health of Saginaw states, in reference to the outbreak, that between October 16 and 19, 1910, there developed in Saginaw 42 cases of smallpox, most of which were of the confluent type, and that nearly all of them were taken to the detention hospital. Cases developing later were taken care of in their homes, guards being placed in charge. General vaccination was then enforced and continued until over 40,000 persons had been vaccinated (Saginaw had a population of 50,510, census of 1910). All public places of entertainment were closed, and for three weeks the city was under quarantine, which terminated November 26, since which date no case of smallpox has occurred.

During the outbreak there were 156 cases with 47 deaths, a mortality of 30.13 per hundred cases. Of the 156 cases, 45 were under 10 years of age, 35 between 10 and 20 years, 31 between 20 and 30 years, 15 between 30 and 40 years, 20 between 40 and 50 years, and 10 were over 50 years of age; 87 were males and 69 females. Of the 47 deaths, 24 occurred at the hospital and 23 at the patients' homes.

## LAPEER.

In Lapeer and vicinity there had also been cases of nonvirulent smallpox for some time. Then during August and September no cases were reported in the city or county. In October there were 2 cases with 1 death and in November 31 cases with 16 deaths, of which 30 cases and 15 deaths were in the home for the feeble-minded. In December there were 5 cases and 2 deaths, of which 1 case and 1 death were in the home referred to. No cases were reported during the next two months. During October, November, and December the cases reported numbered 38 and the deaths 19, a death rate of 50 per hundred cases.

The chronological relationship of the virulent to the nonvirulent cases in the three Michigan outbreaks is shown by the following table:

*Michigan outbreaks of virulent smallpox.*

Date.	Bay City.		Bay County, including city.		Saginaw City.		Saginaw County, including city.		Lapeer City.		Lapeer County, including city.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1909—November.....			4									
December.....	1		42									
1910—January.....	9		26		23		23					
February.....	1		11		17		24		5		5	
March.....	61	8	71	9	50		56		5		18	
April.....	29	13	29	13	21		37		6		11	
May.....	13	7	23	7	12		23		3		8	
June.....	5	1	5	1	17		30				12	
July.....	2	1	2	1	2		2				4	
August.....	2		2		3		3					
September.....	1		1		3		5					
October.....	1		1		81	19	88	19	2	1	2	1
November.....					82	29	148	33	31	16	33	16
December.....			1				3	3	5	2	1	
1911—January.....			1									
February.....												

## CLEVELAND, OHIO.

There was in Cleveland from April 30 to July 26, 1910, a total of 62 cases of smallpox with 10 deaths and 2 cases of permanent disability. There was no instance of the disease in those recently vaccinated. One patient of about 45 years of age gave an indefinite history of vaccination in childhood; there was, however, no scar. Another patient had been vaccinated between 17 and 20 years before, according to his recollection. Two medical students vaccinated on the day of exposure had very mild attacks. All the other cases were among unvaccinated children. Nine of the deaths were in children under

10 years of age. The deaths in this outbreak were at the rate of 16.13 per hundred cases.<sup>1</sup>

BEE COUNTY, TEX.

On January 1, 1910, the health officer of Bee County was called to see a patient who had smallpox. There were 9 other people living in the house, all of whom refused to be vaccinated, saying that they preferred smallpox to vaccination. A man and 2 women from another house who had visited the patient before the nature of the disease was known submitted to vaccination. The vaccination was successful, however, only in 1 of the women. Thus of the 12 who had been exposed to the disease there was but 1 who had ever been successfully vaccinated; that is the woman above referred to. This woman did not contract the disease; the other 11 did. The original case and the 11 secondary ones made 12 in all, and of these 5 died. A death rate of 41.66 per hundred cases.

MARION COUNTY, OREGON.

For several years smallpox had appeared annually in the State of Oregon, but generally so mild that it had caused but little concern. In 1903, however, there had been an outbreak of a virulent type of the disease in Crook County in which there had been a total of 29 cases. Of the persons who contracted the disease 17 had been vaccinated at some time or other. These 17 recovered. Of the 12 who had never been vaccinated 9 died.

In November, 1910, a retired farmer accompanied by his wife and an unmarried daughter left Ohio to visit two sons, one in the City of Mexico and the other in Marion County, Oreg. They first went to Mexico City. On the way from there to Oregon the conductor of the car in which they were traveling discovered a case of convalescent smallpox in a person occupying a seat in the car. This person was put off the train at the next station and the train proceeded on its way. The family after spending a few days in Los Angeles and San Francisco proceeded to Oregon, where the second son was living. The mother was taken ill on the day of arrival (Thanksgiving Day) with smallpox of such a mild character that a diagnosis was not made at the time and no physician was called. (She had been vaccinated 55 years before.) On December 5 the father developed a severe attack of smallpox and died before the eruption reached the pustular stage; the son died 2 days later, and the unmarried daughter 3 days later; the son's wife also became ill and died. The grandchild had a severe attack and recovered much disfigured. (None of these 5 had ever been vaccinated.) Three nurses were engaged before the diagnosis was made, of whom only 1 had ever been vaccinated. As soon as the nature of the disease was discovered all contacts were promptly vaccinated. The domestic employed in the house and 2 of the nurses also contracted the disease, but recovered. There were in all 9 cases with 4 deaths. (Bull. Oregon State Board of Health, vol. 4, No. 4, p. 1.)

<sup>1</sup> Ford, C. E., superintendent of health, Cleveland, Public Health Reports, Vol. XXV, No. 34, Aug. 26, 1910, p. 1179.

<sup>2</sup> Moffett, C. T., health officer, Bee County, Tex. Public Health Reports, Vol. XXV, No. 11, Mar. 18, 1910, p. 319.

## GRADY COUNTY, OKLA.

In Grady County the deaths due to smallpox were comparatively numerous throughout the year compared with the number of cases reported. From March to December, inclusive, there were 50 cases with 20 deaths, a fatality rate of 40 per hundred cases. No other details concerning the disease in this locality are available at the present time.

## OKLAHOMA COUNTY, OKLA.

There was a sudden virulent manifestation of the disease in this county during March and April. Cases occurring during succeeding months seem to have been mild in form with the exception of 1 death in July. From March to July, inclusive, there were 37 cases with 20 deaths, a fatality rate of 54.05 per hundred cases.

## RENO COUNTY, KANS.

Many cases of mild smallpox had existed for several months when in July out of 8 cases reported 3 died. These deaths were the only ones reported out of 193 cases occurring from November, 1909, to December, 1910.

## DENTON COUNTY, TEX.

In Denton County during January and February, 1910, 80 cases of smallpox were reported with 14 deaths. Reports for the entire year are not available nor are the details of the outbreak. The mortality rate of the reported cases was 17.5 per hundred.

*Outbreaks of virulent smallpox in Oklahoma, Kansas, and Texas.*

Date.	Oklahoma.				Kansas— Reno County.		Texas— Denton County.	
	Grady County.		Oklahoma County.					
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1909—November.....					16			
December.....					57			
1910—January.....					50		24	4
February.....					28		56	10
March.....	5		17	14	17			
April.....	8	1	9	4	15			
May.....	6	6	1	1				
June.....	8	4			8	3	1	
July.....	3	5	10	1				
August.....	7	1	2					
September.....	8							
October.....	2	2	1					
November.....	2	1			1			
December.....	1		1		1			
1911—January.....	2		11					
February.....	2		9					

## NEW YORK CITY.

From April 16 to May 28, 10 cases of smallpox with 3 deaths were reported in New York City.



## TABLES.

TABLE No. 1.—Showing, by States, cases reported, case rates, deaths reported, and case mortality rates.

	Cases.	Case rate per 100,000 inhabit- ants. <sup>1</sup>	Deaths.	Case mor- tality rate per 100.	Remarks.
Alabama.....	616		(?)		No available record of cases for entire State. These cases were reported in Birmingham, Mobile, and Montgomery.
Alaska.....	(?)		(?)		Cases not reported.
Arizona.....	(?)		(?)		No available record of cases.
Arkansas.....	106		(?)		No available record of cases for State. These cases were reported in Argenta, Little Rock, Lonoke, and Fort Smith.
California.....	177		1		Incomplete.
Colorado.....	1,096	136.23	7	0.64	
Connecticut.....	None.		None.		
Delaware.....	(?)		(?)		No available record of cases.
District of Columbia.....	96	28.89			
Florida.....	1,286	169.50	12	.93	
Georgia.....	389		(?)		No available record of cases for State. These cases were reported in the city of Macon.
Idaho.....	(?)		(?)		No available record of cases.
Illinois.....	730	12.91	(?)		
Indiana.....	764	28.24	1	.13	
Iowa.....	850	38.19	1	.12	
Kansas.....	2,202	129.77	12	.54	
Kentucky.....	(?)				No available record of cases.
Louisiana.....	860		5		Reports are incomplete.
Maine.....	8	1.07			
Maryland.....	6	.46			
Massachusetts.....	144	4.26			
Michigan.....	2,585	91.66	121	4.68	
Minnesota.....	1,002	48.18	9	.90	
Mississippi.....	227		5		No available record of cases for State. These cases were reported from 7 cities.
Missouri.....	287		2		Do.
Montana.....	634	167.32	1	.16	
Nebraska.....	51		(?)		No available record of cases for State. These cases were reported from Lincoln and South Omaha.
Nevada.....	(?)		(?)		No available record of cases.
New Hampshire.....	10	2.32			
New Jersey.....	22	.86			
New Mexico.....	(?)		(?)		No available record of cases.
New York.....	353	3.85	8	2.26	
North Carolina.....	4,281	193.45	8	.18	
North Dakota.....	306	52.51	2	.65	
Ohio.....	759	15.88	10	1.32	
Oklahoma.....	2,342	139.75	99	4.22	
Oregon.....	164	24.18	5	3.05	
Pennsylvania.....	168	2.18	6	3.57	
Rhode Island.....					No cases reported.
South Carolina.....	(?)		(?)		No available record of cases.
South Dakota.....	365		1		Report complete for April to December, inclusive.
Tennessee.....	2,199		10		Incomplete.
Texas.....	2,925	74.72	67	2.29	
Utah.....	966	257.32	2	.21	
Vermont.....					No cases reported.
Virginia.....	350		6		No available record of cases for State. These cases were reported from 8 cities.
Washington.....	583	50.46	14	2.40	
West Virginia.....	(?)		(?)		No available record of cases.
Wisconsin.....	443	18.94	(?)		
Wyoming.....	(?)		(?)		No available record of cases.
Total.....	30,352		415		

<sup>1</sup> Based upon the estimated population July 1, 1910, as given by the Director of the Census.

TABLE No. 2.—*Showing cases reported by months.*<sup>1</sup>

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Colorado.....	82	132	179	114	117	68	62	14	39	73	112	104	1,096
Florida.....	50	61	213	118	180	162	81	28	17	11	107	258	1,286
Illinois.....	170	32	88	58	74	92	24	16	8	52	84	32	730
Indiana.....	189	92	104	92	98	82	6	1	2	53	45	764	
Iowa.....	122	109	97	141	68	76	23	17	9	12	50	126	850
Kansas.....	441	280	256	148	304	247	43	20	9	66	211	177	2,202
Maine.....		6			1						1		8
Maryland.....	1			1	3		1						6
Massachusetts.....	90	26	5	4	10	7	2						144
Michigan.....	290	262	356	253	370	316	104	65	32	101	339	97	2,585
Montana.....	122	116	68	64	70	53	33	8	15	18	17	50	634
New Hampshire.....	4	3										3	10
New Jersey.....		2	1		3	2	2	3	4	3		2	22
New York.....	51	50	69	61	55	41	10	10	1	1	2	2	353
North Carolina.....	877	758	429	317	249	219	115	91	45	197	244	740	4,281
North Dakota.....	46	32	107	14	22	20	6	38	2	3	9	7	306
Ohio.....	104	83	60	77	178	168	46	4	8	11	8	12	759
Oklahoma.....	238	388	390	475	214	267	69	51	65	46	48	91	2,342
Oregon.....	36	29	29	12	12	14			12	7	2	11	164
Pennsylvania.....	14	41	40	8	22	7	23	4	6		1	2	168
Texas.....	706	785	581	228	199	246	42	17	8	32	28	53	2,925
Utah.....	181	91	112	79	64	27	21	11	42	35	91	212	966
Washington.....	120	82	60	78	54	36	15	4	7	5	41	81	583
Wisconsin.....	39	63	66	33	50	37	32	10	12	14	37	50	443
Total.....	3,973	3,523	3,310	2,375	2,417	2,187	754	417	342	689	1,485	2,155	23,627

<sup>1</sup> This table includes only the States for which the cases were reported by months.

## DESCRIPTION OF MAPS.

The first map shows the number of cases of smallpox reported in each of the States from which complete reports were received. Each dot represents 10 cases. A dot is also inserted for the fraction of 10 where such exists. That is, 16 cases would be represented by 2 dots, 1 for the 10 cases and 1 dot for the fractional 6. More than 20 but less than 30 cases would be represented by 3 dots, and so on.

The dots are not placed within the States to show the localities in which the cases occurred. The small size of the map and the large number of dots in many of the States would not permit such an arrangement.

The States containing interrogation points are those from which reports were not received for the year 1910. In some of these States the disease is not required to be reported; in others its notification is required by law or regulation, but the requirement was not enforced. There is no known reason for presuming that the disease was any less prevalent in the States marked by interrogation points than it was in those not so marked.

The concentric circles show the approximate location of outbreaks in which the disease assumed a virulent form.

The second map shows the distribution of cases according to population. The number of dots in each State shows the actual number of cases of smallpox reported for each 100,000 inhabitants.



